



## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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In re Application of:

Michael HECKMEIER et al.

Serial No.: 09/465,006

Examiner: Shean Chiu Wu

Filed: December 16, 1999

Group Art Unit: 1756

Title: LIQUID-CRYSTAL MEDIUM, AND ELECTRO-OPTICAL DISPLAY  
CONTAINING THE LIQUID-CRYSTAL MEDIUMDECLARATION UNDER 37 C.F.R. §1.132Assistant Commissioner for Patents  
Washington, DC 20231

Sir:

I, Michael Heckmeier, being duly warned, declare that:

I am a citizen of Germany, residing in Hemsbach, Germany.

I am a physicist, having studied at the University, Freiburg, Germany; from 1989 to 1994.

I am graduated from the University, Freiburg, Germany, 1994.

From 1995 to 1998, I did experimental work at Institut Charles Sadron, CNRS, France for my thesis entitled:

“Vielfachstreuung von Licht in dynamisch heterogenen und optisch anisotropen Medien”.

I obtained the Dr. rer. nat degree from Konstanz University, Germany in 1998.

Since February 1998, I have been working as a physicist at Merck KGaA, Darmstadt, Germany, in the field of liquid-crystalline materials and their applications in electro-optical displays.

I am heading a laboratory in Merck KGaA's department for physical research on liquid crystals.

I am author or co-author of various articles in the field of physical properties of liquid-crystalline materials and their applications in electro-optical displays.

I am inventor or co-inventor of more than 110 inventions in the field of liquid-crystalline materials and their applications in electro-optical displays.

I am an inventor of the above-captioned application and am, therefore, familiar with the invention described therein and with the grounds for rejection made against the claims of the application in the Final Office Action mailed June 18, 2003, from the U.S. Patent and Trademark Office, including the Kondo reference, U.S. Patent No. 6,210,761.

The following experiments were conducted under my supervision.

The liquid-crystal media shown in each of the examples of the instant specification were tested to determine their dielectric anisotropy,  $\Delta\epsilon (= \epsilon_{||} - \epsilon_{\perp})$ , and their ratio of dielectric constants parallel and perpendicular to the director,  $\epsilon_{||}/\epsilon_{\perp}$ . The data are shown in the table below. It shows that the media of Examples 1, 3, 4 and 12 (and the comparative example) are not within the scope of the instant claims because they do not meet the claim recitation of dielectric anisotropy,  $\Delta\epsilon$ , and/or ratio of dielectric anisotropies parallel and perpendicular to the director,  $\epsilon_{||}/\epsilon_{\perp}$ . The same determinations were made for media according to Examples 17 and 19 of the Kondo '761 reference. These data are also shown in the table.

The data were determined by methods known in the art, such as discussed at page 22-24 and used in the Examples of the instant specification.

A comparison of the data for applicants' compositions which remain in the claimed scope, i.e., Examples 2, 5-11, 13 and 14, with those of Kondo show that the Kondo media exhibit a significantly increased  $\epsilon_{||}/\epsilon_{\perp}$  property in comparison to applicants' claimed

compositions. This distinction is significant since, as pointed out in the instant specification (page 3, lines 25-29), it is desirable for certain displays to have a dielectric constant perpendicular to the molecular axis, i.e.,  $\epsilon_{\perp}$ , as large as possible. A large  $\epsilon_{\perp}$  obviously means a smaller ratio of  $\epsilon_{\parallel}/\epsilon_{\perp}$ , as achieved according to the invention and not in the Kondo examples.

Example of Specification	$\Delta\epsilon$	$\epsilon_{\parallel}/\epsilon_{\perp}$
1	6.6	2.38
2	5.5	<u>1.93</u>
3	<0	0.51
4	11.5	2.79
5	5.5	<u>1.93</u>
6	4.1	1.78
7	4.8	1.87
8	<u>3.2</u>	1.58
9	4.9	1.91
10	3.7	1.70
11	4.3	1.81
12	4.8	2.04
13	<u>3.2</u>	1.58
14	4.9	1.89
Comp Example 1	4.3	2.48
Kondo Ex. 17	5.9	1.97
Kondo Ex. 19	4.5	2.37

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date: 26/09/2003

Michael Heckmeier